

拒絶引用S04 P173/W000

S04P 1731 W000

## 公開実用平成 1-155654

⑩日本国特許庁 (JP)

⑪実用新案出願公開

⑫公開実用新案公報 (U)

平1-155654

⑬Int. Cl.

H 01 M 2/10

識別記号

序内整理番号

E-6340-5H

C-6340-5H

⑭公開 平成1年(1989)10月25日

審査請求 未請求 請求項の数 1 (全 頁)

⑮考案の名称 パツテリバツク取付構造

⑯実 願 昭63-52346

⑰出 願 昭63(1988)4月19日

⑱考 案 者 内 田 徳 幸 神奈川県横浜市神奈川区守屋町3丁目12番地 日本ピクタ  
ー株式会社内

⑲出 願 人 日本ピクター株式会社 神奈川県横浜市神奈川区守屋町3丁目12番地

⑳代 理 人 弁理士 伊 東 忠 彦 外1名

BEST AVAILABLE COPY

---

## 公開実用平成 1-155654

### 従来の技術

従来のバッテリパック取付構造としては、例えば第6図に示すものがある。第6図中、バッテリパック1はビデオカメラ（図示せず）のグリップ部等に装着されて使用される充電式のバッテリである。バッテリパック1の底部両側には側方に突出する係合突部1aが設けられている。尚、係合突部1aは所定長さを有し、一定の間隔毎に複数個（第6図では片側3個ずつ）設けられており、各係合突部1a間には凹部1bが形成されている。又、一の係合突部1aの上面には「+」の電極が設けられ、別の係合突部1aの上面には「-」の電極が設けられている。

上記バッテリパック1は使用前にバッテリチャージャ2によって充電される。バッテリチャージャ2は、その上面に取付部2aを有する。取付部2aは上部開口2bと、端面2c側の側部開口2dとを有しており、上部開口2bの両側にはバッテリパック1の係合部1aに対応する形状の凹部2eと、凹部2e間で内方に突出する係合部

## 公開実用平成1-155654

2b、及び端面2c側の側部開口2dに挿入される。

次に、バッテリパック1が矢印A方向にスライドすると、バッテリパック1の各係合突部1aが取付部2aの各係合部2eの下側の溝内に嵌入する。これにより、バッテリパック1の電極とバッテリチャージャ2の電極とが接続される。同時に係止用フック3の先端係止部3aがバッテリパック1の底面凹部に嵌入し、バッテリパック1の取付操作が完了する。

尚、充電後バッテリパック1は上記取付作業と逆の手順により取外される。即ち、バッテリパック1を矢印B方向に摆動させると、その押圧力により係止用フック3が下方に変位しバッテリパック1の係止を解除するので、後はバッテリパック1を上方に持ち上げれば良い。

### 考案が解決しようとする課題

上記バッテリパックにおいては、例えば屋外等でビデオカメラを使用する際1個のバッテリパックでより長い時間使用できることが要望されてい

## 公開実用平成 1-155654

取付操作時の負荷が大きくなり、使い勝手が悪くなる。又上記②では、ロック機構により構成が複雑化してしまい、部品点数が増えて製造コストが高価になるとともに、ロック操作及びロック解除操作を要するといった課題が生ずる。

本考案は上記課題を解決したバッテリパック取付構造を提供することを目的とする。

### 課題を解決するための手段及び作用

本考案は、上記バッテリ取付構造において、取付部の外側面に開口を開閉するよう滑動自在に設けられたストッパ部材と、ストッパ部材を取付部に取付けられたバッテリパックの端部に対向し、開口を閉とする位置に附勢する附勢部材とを具備してなり、バッテリパックを取付部に確実に保持するようにしたものである。

### 実施例

第1図及び第2図に本考案になるバッテリパック取付構造の一実施例を示す。

両図中、バッテリチャージャ11の上部には取付部11aが設けられている。バッテリパック

## 公開実用平成1-155654

部材14は本体13の外側面13cに対向するストッパ本体14aと、ストッパ本体14aの裏面より突出する腕部14bと、腕部14bの先端で上、下方向に貫通する貫通孔14cと、ストッパ本体14aの表面の略中央より突出するツマミ14dとよりなる。ツマミ14dの端面には滑り止めとしての凹凸部が設けられている。

上記形状のストッパ部材14は第2図(A)乃至(C)に示す如く、バッテリチャージャ11の外側面13cに設けられた開口13dに腕部14bを嵌入させて組付けられている。又、腕部14bに穿設された貫通孔14cは上ケース13a内より突出する円柱形状のリブ13a<sub>1</sub>に嵌合している。このリブ13a<sub>1</sub>は下ケース13b内に突出するリブ13b<sub>1</sub>と係合し、本体13の底面よりリブ13b<sub>1</sub>内に挿入されたボルト15により螺着される。又、リブ13a<sub>1</sub>と13b<sub>1</sub>との間にバッテリチャージャ11の基板16が保持されている。

17はコイルばね(附勢部材)で、リブ13a<sub>1</sub>

## 公開実用平成1-155654

孔13fを避けるような形状とされており、ストッパ部材14が下動しても孔13fを閉塞しないようになっている。

次に、上記構成になるバッテリバック取付構造にバッテリバック12を取付ける際の操作につき説明する。

まず、第1図及び第4図(A)に示す如く、バッテリバック12の底部12aをバッテリチャージャ11の取付部11aに相対向させ、バッテリバック12を矢印C方向に降下させる。これにより、バッテリバック12の底部12aが取付部11aの上部開口11b及び側部開口11c内に嵌入する。そして、第4図(B)に示す如く、バッテリバック12の底部12aがストッパ部材14に当接し、これをばね17の押圧力に抗して下動させる。ストッパ部材14はリブ13aにガイドされスムーズに降下する。このように、バッテリバック12の取付操作時には、ばね17がクッションとなるため、取付操作の感触が良好なものとなっている。又、ストッパ部材14の下動

---

## 公開実用平成1-155654

かくして、バッテリバック12は第5図に示すように、係合突部12bがバッテリチャージャ11の係合部11eに係止されて矢印D方向の離脱を阻止され、底部12aがストッパ部材14により矢印B方向への離脱を阻止され、取付操作が完了する。又、バッテリバック12は他の方向へも取付部11aの上部開口11bを開む周縁部により離脱不可とされる。

そのため、バッテリバック12はバッテリチャージャ11より離脱不可状態に保持されたまま充電が行なわれる。このようにして充電されている間、例えばバッテリチャージャ11に外力が作用してバッテリバック12が矢印B方向に変位しようとしても、底部12aがストッパ部材14の上部に当接し、バッテリバック12が取付部11aより外れることが阻止されるため、バッテリバック12の脱落が防止される。又、長時間使用に対応するため、バッテリバック12の容量が大とされている場合、その重量が増加している。このようにバッテリバック12の重量が増加していると、

## 公開実用平成1-155654

取付け、取外し操作が容易であり、しかも安価に製造しうる。又、ストッパ部材14の位置よりバッテリバック12が確実に取付けられていることを外観上確認することができるので便利である。

尚、上記実施例ではバッテリチャージャを例に挙げて本考案になるバッテリバック取付構造を説明したが、これに限らず、バッテリバックを取付けて使用される他の電子機器等にも適用できるのは勿論であり、例えばビデオカメラのバッテリ取付部にも適用できる。特にビデオカメラにおいてバッテリバックをグリップ部に取付ける場合、バッテリバックを直接把持する構成となるが、その場合持ち易くするため、バッテリバックを若干傾斜させて取付けることがある。このような場合、バッテリバックの重量がストッパ部材に常時作用することになるので、大容量のバッテリバックを使用するとき、上記ストッパ部材によりバッテリバックを安定的に保持することができる。

又、上記実施例ではバッテリバックの底部に複数個の係合突部を設けた構成となっているが、こ

## 公開実用平成 1-155654

3図(A)、(B)、(C)は夫々ストッパ部材の形状を示す図、第4図(A)、(B)、(C)は夫々バッテリバックの取付操作を説明するための図、第5図はバッテリバックをバッテリチャージャに取付けた状態を示す斜視図、第6図は従来のバッテリバック取付構造を説明するための斜視図である。

11…バッテリチャージャ、11a…取付部、  
12…バッテリバック、12b…係合突部、11b  
…上部開口、11c…側部開口、11e…係合部、  
11f…係止溝、13a…上ケース、13b…下  
ケース、14…ストッパ部材、15…ボルト、  
17…コイルばね。

実用新案登録出願人 日本ピクター株式会社

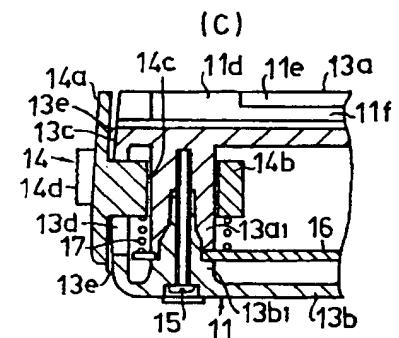
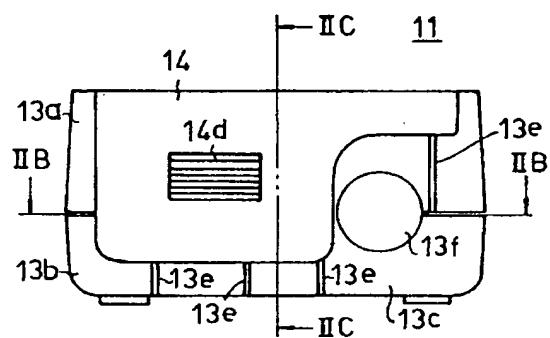
代 理 人 弁理士 伊東忠彦

同 弁理士 松浦兼行

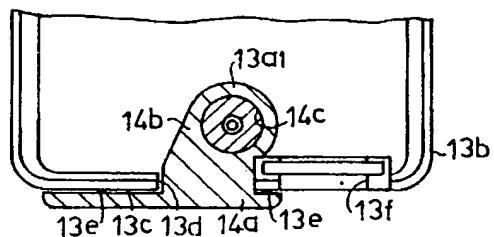
# 公開実用平成1-155654

第2図

(A)



(B)

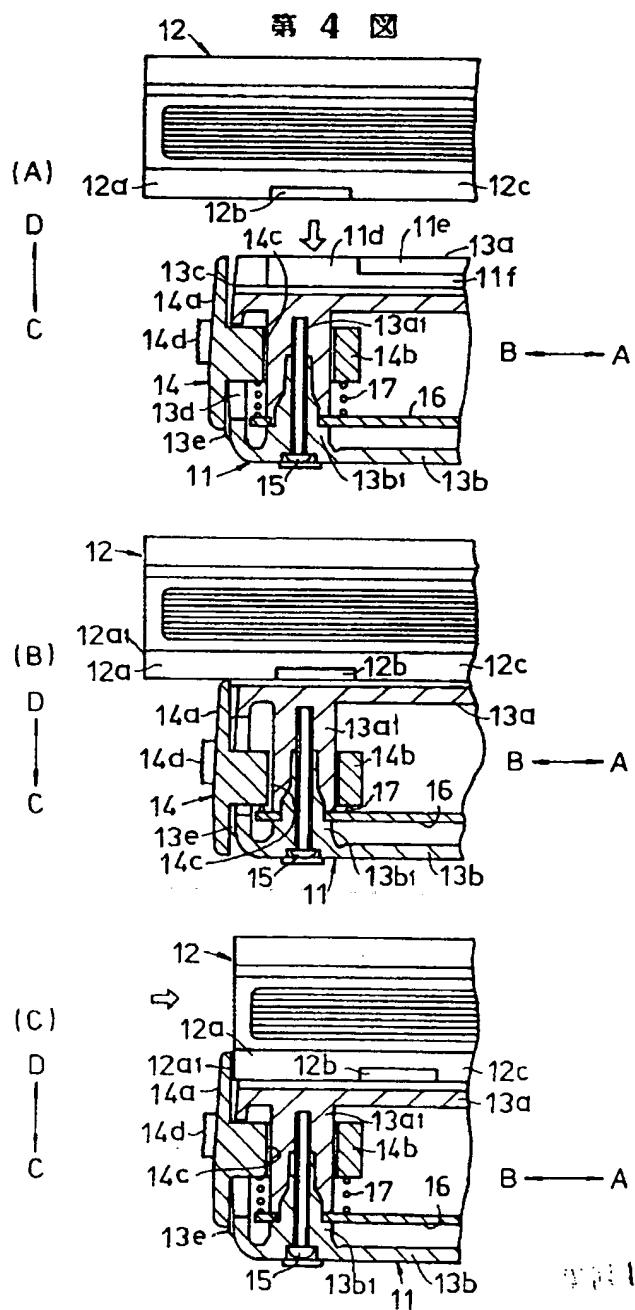


612

知門1-15

代理人弁理士 伊東忠彦

公開実用平成 1-155654



②公開実用新案公報 (U) 平1-155654  
①日本国特許庁 (JP) ②实用新案出願公報  
③Int.Cl. 電気配線号 分内装置番号 E-6340-5H G-6340-5H  
H 01 M 2/10 ④公開 平成1年(1989)10月25日  
⑤著者名 畠山 伸幸 特許庁長官補助金課特許審査課  
⑥出願人 日本エレクトロニクス株式会社 横浜市港北区子母町3丁目12番地  
⑦代理 人 兵庫士伊東 逸彦 外1名  
⑧請求項 内田伸幸 伸素(横浜市港北区子母町3丁目12番地)日本エレクトロニクス株式会社内  
⑨出願日 昭和63(1988)4月19日

⑩実用新案登録番号 S2346  
⑪審査請求未請求 請求項の数 1 (全員)

公開実用新案 1-155654

從圖6國表示中可知，當母線流過某點時，其電壓降為零，此時母線與地之間的電壓即為該點的相對地電壓。在圖6國中， $U_{AB}$ 為A、B兩點對地的相對地電壓； $U_{BC}$ 為B、C兩點對地的相對地電壓； $U_{CA}$ 為C、A兩點對地的相對地電壓。由圖6國可見，在A點開關斷開時， $U_{AB}=0$ ， $U_{BC}=U_{CA}=U$ ；在A點開關閉合時， $U_{AB}=U$ ， $U_{BC}=U_{CA}=0$ ；在B點開關斷開時， $U_{AB}=U$ ， $U_{BC}=0$ ， $U_{CA}=U$ ；在B點開關閉合時， $U_{AB}=U_{CA}=0$ ， $U_{BC}=U$ ；在C點開關斷開時， $U_{BC}=U$ ， $U_{CA}=U_{AB}=0$ ；在C點開關閉合時， $U_{BC}=U_{CA}=0$ ， $U_{AB}=U$ 。

第六〇話

但實際上卻是相反的。事實上，當我們在一個國家裡，我們會發現那裏的社會階級結構和經濟關係與別的國家相比，有著很大的不同。這就是為什麼我們在研究社會主義的時候，要仔細地研究各個國家的歷史、地理、政治、經濟、社會等多方面的因素，才能夠真正地理解社會主義的內容和意義。

2.b、及 2.c 項の問題用口2.dに挿入され

圖四中、八九十年代以來中國社會的變遷

美術

如取操作時間的身體外太老（右手）、便以握手方法（左手）配戴。又上記②右臂、口之力擴張時之手形擴成外擴之姿。其他（左）手則、口之力擴張時之手形擴成外擴之姿。當擴張時身體外側之身體外太老（右手）、便以握手方法（左手）配戴。此時身體外側之身體外太老（右手）、便以握手方法（左手）配戴。

17号にナル端部(剛柔部材)E、H713A、

216φ。

以下に示す4-2-2-11の要領16が採用され  
る。又、H713A、Z13B、Z13D、Z13E  
H713B、内丸頭アゴナットナット15は下記  
通りH713B、Z鋼合板、本体13の底面を5  
mm。C7H713A、以下4-2-13B内丸頭ナット  
の突出部を内丸頭形状のH713A、Z鋼合板にて  
丸頭部を丸頭通孔14C以上4-2-13A用  
金鋼ナットと組合せ5mmにて。又、頭部14B  
外側面13Cの頭付5mmにて頭部13dの頭部14B  
部（C）表示寸法C、A7H713-2-11の  
上品形状のA7H714部材14付第2回（A）乃  
れも上7Cの四面部分頭付5mmにて。

14dを2.5mm。以下3-14dの底面に頭部の  
本体14Aの表面の端中央までの突出寸法Cにて  
上、下方に丸頭通孔5mmにて14C上、下よりA5  
の突出部を頭部14B上、頭部14Bの先端で  
本体14Aの表面にて頭部14B上、下よりA5  
部材14付本体14A上、下よりA5本体14Aの表面

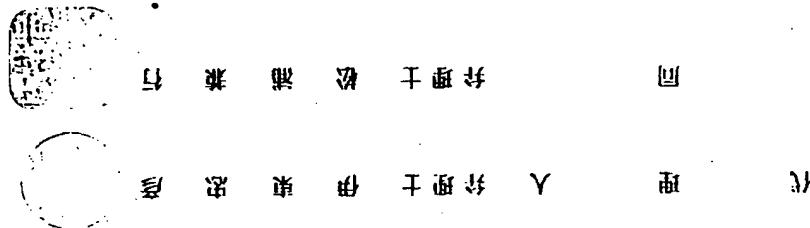
국민의 민족적 정체성을 확립하는 데 있어 학교는 핵심적인 역할을 합니다.

孔 13 于多處以文字形容其古名工物、又以六部卦 14 分小類化之也孔 13 于多處





019



美国新嘉坡登瀛出版人 日本已久一株式会社

• 七二二

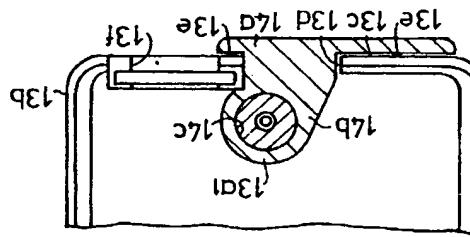
• १५४२

33图(A)、(B)、(C)是关于以下三个部件的形狀表示圖、第4图(A)、(B)、(C)是关于以下三个部件的形狀表示圖、第5图(A)、(B)、(C)是关于以下三个部件的形狀表示圖、第6图(A)、(B)、(C)是关于以下三个部件的形狀表示圖、第7图(A)、(B)、(C)是关于以下三个部件的形狀表示圖。

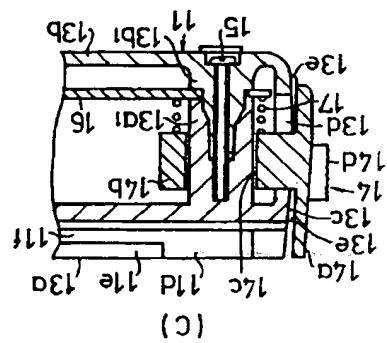
代理人辦理手續 請求書

第111頁

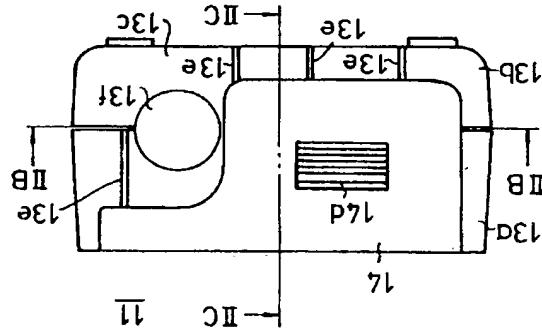
612



(B)



(C)

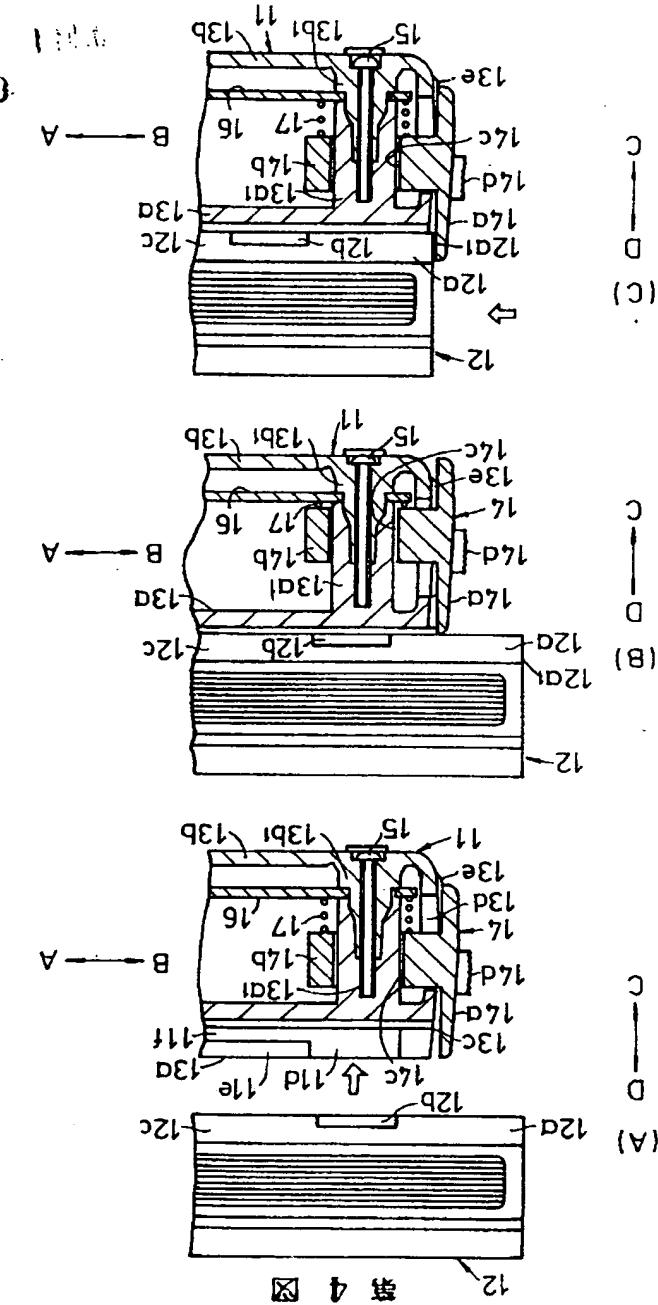


(A)

第2圖

公圖實用平底 1-155654

代碼人生



公關美用平成 1-155654

Japanese Laid-open Utility Model  
Laid-open Number: Hei 1-155654  
Laid-open Date: October 25, 1989  
Application Number: Sho 63-052346  
Filing Date: April 19, 1988  
Applicant: Victor Company of Japan, Limited.

#### SPECIFICATION

##### 1. Title of the Device

Battery Pack Mounting Structure

##### 2. Scope of Claim for Utility Model Registration

A battery pack mounting structure in which a bottom portion of a battery pack having an engagement protrusion on either side thereof is inserted into an opening of a mounting portion, and in which the battery pack is caused to slide to cause the engagement protrusion to be engaged with a lock groove of the mounting portion,

characterized in that the battery pack mounting structure is equipped with a stopper member provided slidably on an outer side surface of the mounting portion so that the stopper member opens and closes the opening, and an urging member urged toward a position where the opening is closed, with the stopper member being opposed to an end portion of the battery pack mounted to the mounting portion.

##### 3. Detailed Description of the Device

###### Field of Industrial Application

The present device relates to a battery pack mounting structure and, in particular, to a battery pack mounting structure constructed

so as to reliably retain a battery pack.

#### Prior Art

Fig. 6 shows an example of conventional battery pack mounting structures. In Fig. 6, a battery pack 1 is a rechargeable battery attached for use to the grip portion, etc. of a video camera (not shown). On either side of the bottom portion of the battery pack 1, there are provided a plurality of (in Fig. 6, three on either side) engagement protrusions 1a protruding sidewise. The engagement protrusions 1a have a predetermined length, and are arranged at fixed intervals, with recesses 1b being formed between the engagement protrusions 1a. A positive electrode is provided on the upper surface of each of some engagement protrusions 1a, and a negative electrode is provided on the upper surface of each of other protrusions 1a.

Before use, the battery pack 1 is charged by a battery charger 2. The battery charger 2 has a mounting portion 2a on the upper surface thereof. The mounting portion 2a has an upper opening 2b and a side opening 2d on the end surface 2c side. On either side of the upper opening 2b, there are provided recesses 2e of a configuration corresponding to the engagement portions 1a of the battery pack 1, and engagement portions 2f arranged between the recesses 2e and protruding inwardly (Positive and negative electrodes are provided on the lower surfaces of the engagement portions 2f). Further, integrally provided on a mounting surface

2g is a locking hook 3 which is to be fitted into a recess (not shown) provided on the bottom surface of the battery pack 1 and is adapted to lock the recess so that the battery pack 1 will not be detached. The locking hook 3 has at its forward end a substantially triangular lock portion 3a, which protrudes upwardly from the mounting surface 2g.

When mounting the battery pack 1 to the battery charger 2, the bottom surface of the battery pack 1 is first opposed to the mounting portion 2a of the battery charger 2. Then, the engagement protrusions 1a of the battery pack 1 are matched with the recesses 2e of the mounting portion 2a, and the battery pack 1 is lowered in the direction of an arrow C so as to fit the engagement protrusions 1a into the recesses 2e. In this process, the engagement portions 2f of the mounting portion 2a are, in turn, fitted into the recesses 1b of the battery pack 1, and the locking hook 3 abuts the bottom surface of the battery pack 1 and retracts into the mounting surface 2g. As a result, the bottom portion of the battery pack 1 is inserted into the upper opening 2b of the mounting portion 2a and into the side opening 2d on the end surface 2c side.

Next, when the battery pack 1 slides in the direction of an arrow A, the engagement protrusions 1a of the battery pack 1 are fitted into grooves under the engagement portions 2f of the mounting portion 2a. As a result, the electrodes of the battery pack 1 are connected with the electrodes of the battery charger 2. At the same

time, the forward-end lock portion 3a of the locking hook 3 is fitted into the recess in the bottom surface of the battery pack 1, whereby the operation of mounting the battery pack 1 is completed.

After charging, the battery pack 1 is detached by procedures reverse to the above-described ones. That is, when the battery pack 1 is caused to slide in the direction of an arrow B, the locking hook 3 is downwardly displaced by its pressing force, and the lock of the battery pack 1 is canceled, so the battery pack 1 to be raised.

#### Problems to be solved by the Device

When the video camera with a battery pack as described above is to be used outdoors, etc., it is required that a single battery pack enables the video camera to be used for a longer period of time. Thus, a battery pack of a large capacity is often used. However, as the capacity of a battery pack increases, its weight also increases, so that, when charging is to be performed with a battery pack 1 of a large capacity mounted to the battery charger 2 shown in Fig. 6, the following problems are involved.

In the battery pack mounting structure shown in Fig. 6, when an impact from outside acts on the battery charger 2 during charging, due to the large weight of the battery pack 1, the lock of the locking hook 3 is canceled, and the battery pack 1 is displaced in the direction of an arrow B to be detached from the battery charger 2.

It might be possible to prevent this detachment of the battery pack 1 by (1) making the elastic force of the locking hook 3 stronger,

(2) providing a lock mechanism for locking the locking hook 3 in a state where the locking hook 3 is engaged with the recess in the bottom surface of the battery pack 1, etc.

However, in the above method (1), the load involved when mounting the battery pack 1 increases, resulting in a rather poor usability. In the above method (2), due to the lock mechanism, the construction becomes rather complicated, and since the number of parts increases, the production cost becomes rather high. Further, it is necessary to perform a locking operation and a lock canceling operation.

It is an object of the present device to provide a battery pack mounting structure in which the above-mentioned problems have been solved.

#### Means for solving the Problems and Operation thereof

According to the present device, there is provided a battery mounting structure equipped with a stopper member which is provided slidably on an outer side surface of a mounting portion so as to open and close an opening, and an urging member which is urged toward a position where the opening is closed, with the stopper member being opposed to an end portion of the battery pack mounted to the mounting portion, in which the battery pack is reliably retained by the mounting portion.

#### Embodiment

Figs. 1 and 2 show a battery pack mounting structure according

to an embodiment of the present device.

In the figures, a mounting portion 11a is provided on the upper portion of a battery charger 11. A battery pack 12 is mounted to the mounting portion 11a, and is charged by the battery charger 11. The battery pack 12 is of the same configuration as the battery pack 1 shown in Fig. 6, and has on either side of the bottom portion 12a thereof a plurality of engagement protrusions 12b (with electrodes on the upper surfaces thereof) and a plurality of recesses 12c, which are provided alternately.

The mounting portion 11a of the battery charger 11 has an upper opening 11b and a side opening 11c. On either side edge portion of the upper opening 11b, there are provided recesses 11d corresponding to the engagement protrusions 12b of the battery pack 12, and engagement portions 11e corresponding to the recesses 12c. The engagement portions 11e protrude into the upper opening 11b, so that their lower surfaces form lock grooves 11f into which the engagement protrusions 12b are fitted (each lock groove 11f has an electrode).

The battery charger 11 has a main body 13, which is formed by integrally combining an upper case 13a and a lower case 13b, with a stopper member 14 being assembled to an outer side surface 13c of the main body 13.

As shown in Figs. 3(A) through 3(C), the stopper member 14 is composed of a stopper main body 14a opposed to the outer side

surface 13c of the main body 13, an arm portion 14b protruding from the back surface of the stopper main body 14a, a through-hole 14c provided at the distal end of the arm portion 14b and extending in the vertical directions, and a knob 14d protruding from substantially the center of the surface of the stopper main body 14a. Asperities forming a non-slip surface are provided at the end surface of the knob 14d.

As shown in Figs. 2(A) through 2(C), the stopper member 14 of the above-described configuration is mounted by fitting the arm portion 14b into an opening 13d provided in the outer side surface 13c of the battery charger 11. Further, the through-hole 14c formed in the arm portion 14b is fit-engaged with a cylindrical rib 13a<sub>1</sub> protruding from within the upper case 13a. The rib 13a<sub>1</sub> is engaged with a rib 13b<sub>1</sub> protruding within the lower case 13b, and is threadedly engaged therewith by a bolt 15 inserted into the rib 13b<sub>1</sub> from the bottom surface of the main body 13. Further, a board 16 of the battery charger 11 is held between the ribs 13a<sub>1</sub> and 13b<sub>1</sub>.

Reference numeral 17 indicates a coil spring (urging member), which is wound around the outer periphery of the rib 13a<sub>1</sub> and is arranged in a compressed state between the arm portion 14b of the stopper member 14 and the board 16. Thus, the board 16 functions as a spring shoe, and the stopper member 14 is pressurized upwardly (in the direction of an arrow D) by the resilient force of the spring 17, that is, toward a position where it closes the side opening

11c.

The opening 13d, into which the arm portion 14b of the stopper member 14 is fitted has a vertical dimension larger than the height dimension of the arm portion 14b. Thus, the stopper member 14 is provided so as to vertically slide while guided by the rib 13a<sub>1</sub>.

Further, a plurality of ribs 13e protrude from the outer side surface 13c of the upper and lower cases 13a and 13b so as to vertically extend. Thus, the stopper member 14 moves vertically, with its back surface sliding on the ribs 13e, so the slide resistance is reduced.

Further, a circular hole 13f is formed in the outer side surface 13c, and a cable (not shown) connected to an AC 100V power source is passed through the hole 13f. In view of this, the stopper main body 14a of the stopper member 14 is formed in a configuration making it possible to avoid the hole 13f, and the hole 13f is not blocked if the stopper member 14 moves downwards.

Next, the operation of mounting the battery pack 12 to the battery pack mounting structure constructed as described above will be illustrated.

First, as shown in Figs. 1 and 4(A), the bottom portion 12a of the battery pack 12 is opposed to the mounting portion 11a of the battery charger 11, and the battery pack 12 is lowered in the direction of an arrow C. As a result, the bottom portion 12a of the battery pack 12 is fitted into the upper opening 11b and the side opening 11c of the mounting portion 11a. Then, as shown in

Fig. 4(B), the bottom portion 12a of the battery pack 12 abuts the stopper member 14, and lowers it against the resilient force of the spring 17. The stopper member 14 descends smoothly while guided by the rib 13a<sub>1</sub>. In this way, during the operation of mounting the battery pack 12, the spring 17 serves as a cushion, so that the feel in the mounting operation is a satisfactory one. Simultaneously with the downward movement of the stopper member 14, the engagement protrusions 12b of the battery pack 12 are fitted into the recesses 11d of the mounting portion 11a.

Next, as shown in Fig. 4(C), the battery pack 12 is caused to slide in the direction of an arrow A. As a result, the engagement protrusions 12b of the battery pack 12 are fitted into the lock grooves 11f formed under the engagement portions 11e of the mounting portion 11a. As a result, the engagement protrusions 12b are engaged with and locked to the engagement portions 11e, and the electrodes (not shown) provided on the engagement protrusions 12b are electrically connected to the electrodes (not shown) on the battery charger 11 side, which are provided in the lock grooves 11f.

Further, when the battery pack 12 slides in the direction of the arrow A and its end portion 12a<sub>1</sub> passes over it, the stopper member 14, which has been pressed by the bottom portion 12a of the battery pack 12 to move downwardly, is caused to move upwardly by the resilient force of the spring 17 as shown in Fig. 4(C), closing the side opening 11c. Thus, the upper portion of the stopper main

body 14a of the stopper member 14 is restored to the height at which it is opposed to the end surface 12a<sub>1</sub> of the bottom portion 12 of the battery pack 12.

In this way, as shown in Fig. 5, the battery pack 12 is prevented from being separated in the direction of the arrow D due to the locking of the engagement protrusions 12b by the engagement portions 11e of the battery charger 11, and the bottom portion 12a is prevented from being separated in the direction of the arrow B by the stopper member 14, thus completing the mounting operation. Further, the battery pack 12 is prevented from being separated in any other direction by the peripheral edge portion surrounding the upper opening 11b of the mounting portion 11a.

Thus, the battery pack 12 undergoes charging while retained by the battery charger 11 in a state in which separation is impossible. If, while charging is being thus conducted, an external force is applied, for example, to the battery charger 11 to make the battery pack 12 inclined toward displacement in the direction of the arrow B, the battery pack 12 is prevented from being detached from the mounting portion 11a due to the abutment of the bottom portion 12a against the upper portion of the stopper member 14, thus preventing the battery pack 12 from being detached. When the capacity of the battery pack 12 has been increased for long-term use, an increase in the weight of the battery pack 12 is involved. When the weight of the battery pack 12 has been thus increased, the battery pack

12 will attempt to move with a still larger force if an external force is applied to the battery charger 11. However, regarding the direction of the arrow B, the stopper member 14 keeps the side opening 11c closed. Further, the stopper member 14 is engaged with the rib 13a<sub>1</sub> of the upper case 13, so that detachment of the battery pack 12 is prevented reliably.

After the completion of the charging, by pushing down the knob 14d of the stopper member 14, the stopper member 14 moves downward to the position where it opens the side opening 11c as shown in Fig. 4(B). As a result, the battery pack 12 can move in the direction of the arrow B. Thus, the battery pack 12 is detached by procedures reverse to the above-described ones. That is, the battery pack 12 is once drawn out in the direction of the arrow B, and the engagement protrusions 12b are detached from the engagement grooves 11f. Then, the battery pack 12 is raised upwardly (in the direction of the arrow D) to be detached from the battery charger 11.

In this way, it is possible to reliably retain the battery pack 12 with a simple structure, so that the operation of mounting and detaching the battery pack 12 is easy to perform. Further, a reduction in production cost is achieved. Further, it is possible to visually check from the position of the stopper member 14 whether the battery pack 12 has been reliably mounted or not, which is convenient.

While in the above-described embodiment the battery pack

mounting structure of the present device is applied to a battery charger, this should not be construed restrictively. Needless to say that the present device is also applicable to other electronic apparatuses used with a battery pack mounted thereon. For example, it is also applicable to the battery mounting portion of a video camera. In particular, when a battery pack is mounted to the grip portion of a video camera, the battery pack is to be directly grasped. In this case, to enable the video camera to be easily carried, the battery pack may be somewhat inclined in the mounted state. Then, the stopper member is constantly subjected to the weight of the battery pack, so when using a battery pack of a large capacity, it is possible to retain the battery pack in a stable manner due to the above-described stopper member.

While in the above-described embodiment a plurality of engagement protrusions are provided on the bottom portion of the battery pack, this should not be construed restrictively. Needless to say that the present device is also applicable to a construction in which a battery pack with a continuous engagement protrusion extending in the longitudinal direction thereof is mounted to the mounting portion of a battery charger by sliding.

#### Effects of the Device

As described above, in the battery pack mounting structure of the present device, even when a heavy battery pack is mounted, it is possible to reliably prevent detachment of the battery pack

due to the stopper member. Further, since it can be realized in a simple construction, the present device does not involve any increase in production cost. Further, the operation of mounting and detaching the battery pack is easy to perform. Furthermore, it is possible to see from the position of the stopper member whether the battery pack has been positively mounted or not, which means it is advantageously possible to easily perform visual checking on the mounting condition of the battery pack, etc.

#### 4. Brief Description of the Drawings

Fig. 1 is an exploded perspective view for illustrating a battery pack mounting structure according to an embodiment of the present device; Figs. 2 (A), 2 (B), and 2 (C) are a sideview, a partially cutaway plan view, and a longitudinal sectional view, respectively, for illustrating a main portion of the mounting structure of the present device; Figs. 3 (A), 3 (B), and 3 (C) are diagrams showing the configuration of the stopper member; Figs. 4 (A), 4 (B), and 4 (C) are diagrams for illustrating a battery pack mounting operation; Fig. 5 is a perspective view of a battery pack as mounted to a battery charger; Fig. 6 is a perspective view for illustrating a conventional battery pack mounting structure.

11 battery charger, 11a mounting portion, 12 battery pack, 12b engagement protrusion, 11b upper opening, 11c side opening, 11e engagement portion, 11f lock groove, 13a upper case, 13b lower case, 14 stopper member, 15 bolt, 17 coil spring

Applicant: Victor Company of Japan, Limited.

Agents: Tadahiko Ito, Patent Attorney

Kaneyuki Matsuura, Patent Attorney

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**